

CLAIMS

1. A flying disc comprising:
 - a disc-shaped body member having a first surface and a second surface and terminating at its periphery in an annular rim; said first surface being essentially flat; said rim extending in a direction substantially away from the plane of said first surface and together with said second surface defining a semi-enclosed space;
 - an electronics housing centrally located on said second surface, located entirely within said semi-enclosed space with no portion thereof protruding from said first surface, and having a maximum external housing radius of one-fourth or less of the radius of said annular rim;
 - an electronic source of light located entirely within said electronics housing; and
 - an optical fiber located to receive light from said light source.
- 15 2. A flying disc as in claim 1 wherein said maximum external radius of said electronics housing is one-fifth or less of the radius of said annular rim.
3. A flying disc as in claim 1 wherein said maximum external radius of said electronics housing is one-seventh or less of the radius of said annular rim.
4. A flying disc as in claim 1 wherein said electronics housing is circular.
- 20 5. A flying disc as in claim 2 wherein said external radius of said circular electronics housing ranges from 0.75 inches to 1.5 inches.
6. A flying disc as in claim 1 wherein said electronic source of light comprises a light emitting diode (LED) and a battery.
- 25 7. A flying disc as in claim 6 and further including a dual battery adapter and there are two of said batteries located in said adapter.
8. A flying disc as in claim 1 and further including at least one rib attached to said second surface and wherein said optical fiber is located within said rib.
9. A flying disc as in claim 1 wherein said electronic source of light 30 includes a light switch.
10. An aerodynamic toy/athletic device comprising:

a gliding body terminating at its periphery in an annular rim;

a light source attached to said gliding body, said light source including only one light emitting diode (LED), said LED comprising a semiconductor chip embedded in a dielectric casing; and

5 a plurality of optical fibers attached to said gliding body, each said optical fiber having one end embedded in said dielectric casing.

11. An aerodynamic toy/athletic device as in claim 10 wherein said LED is substantially centrally located on said gliding body.

12. An aerodynamic toy/athletic device as in claim 10 wherein said light 10 source further includes a battery, said LED further includes a pair of electrical leads, and said electrical leads directly contact said battery.

13. An aerodynamic toy/athletic device as in claim 10 wherein said gliding body comprises a disc-shaped body member having a first surface and a second surface and terminating at its periphery in an annular rim; said rim 15 extending in a direction substantially away from the plane of said first surface and together with said second surface defining a semi-enclosed space.

14. An aerodynamic toy/athletic device as in claim 13 and further including a plurality of ribs attached to said second surface and wherein one of said optical fibers is located in each of said ribs.

20 15. An aerodynamic toy/athletic device as in claim 14 wherein each of said ribs further includes a channel formed in said rib and said optical fiber associated with said rib is located in said channel.

16. An aerodynamic toy/athletic device as in claim 15 wherein said channels do not penetrate the inside edge of said rim.

25 17. An aerodynamic toy/athletic device as in claim 15 wherein said disc-shaped body, said rim, and said channels are translucent.

18. An aerodynamic toy/athletic device as in claim 15 wherein said ribs further include an opening formed in said ribs and wherein said opening has a smaller diameter than said channel.

30 19. An aerodynamic toy/athletic device as in claim 10 wherein said dielectric casing comprises epoxy.

20. An aerodynamic toy/athletic device comprising:
a gliding body terminating at its periphery in an annular rim; and
a light source attached to said gliding body, said light source comprising:
a light emitting diode (LED), said LED comprising a semiconductor

5 chip embedded in a dielectric casing;

a pair of electrical leads attached to said semiconductor chip;
and a battery source;

wherein said electrical leads directly contact said battery source.

21. An aerodynamic toy/athletic device as in claim 20 wherein said
10 gliding body further includes an optical fiber material attached to said gliding body
and located to receive light from said light source.

22. An aerodynamic toy/athletic device as in claim 20 wherein said
gliding body comprises a disc-shaped body member having a first surface and a
second surface and terminating at its periphery in an annular rim; said rim
15 --extending in a direction substantially away from the plane of said disc and together
with said second surface defining a semi-enclosed space.

23. An aerodynamic toy/athletic device as in claim 22 and further
including a plurality of ribs attached to said second surface and wherein one of
said optical fiber material is located in each of said ribs.

24. An aerodynamic toy/athletic device as in claim 23 wherein each of
said ribs further includes a channel formed in said rib and said optical fiber material
associated with said rib is located in said channel.

25. An aerodynamic toy/athletic device as in claim 24 wherein said
channels abut but do not penetrate the inside edge of said rim.

26. An aerodynamic toy/athletic device as in claim 24 wherein said disc-
shaped body, said rim, and said channels are translucent.

27. An aerodynamic toy/athletic device as in claim 24 wherein said ribs
further include an opening formed in said ribs and wherein said opening has a
smaller diameter than said channel.

28. An aerodynamic toy/athletic device as in claim 20 wherein:
said battery source comprises a dual battery assembly including a dual

battery adapter and a first battery and a second battery located in said adapter; and

wherein said first lead contacts said first battery and said second lead contacts said second battery.

5 29. An aerodynamic toy/athletic device as in claim 20 and further including a switch including one of said leads.

30. A flying disc comprising:

a disc-shaped body member having a first surface and a second surface and terminating at its periphery in an annular rim; said first surface being

10 essentially flat; said rim extending in a direction substantially away from the plane of said disc and together with said second surface defining a semi-enclosed space;

an electronics housing centrally located on said second surface;

an electronic source of light located entirely within said electronics housing;

a plurality of ribs attached to said second surface and extending radially

15 from said electronics housing; and

a plurality of optical fibers, each said optical fiber located in one of said ribs.

31. A flying disc as in claim 30 wherein each of said ribs further includes a channel formed in said rib and said optical fiber associated with said rib is located in said channel.

20 32. A flying disc as in claim 31 wherein said channels abut but do not penetrate the inside edge of said rim.

33. A flying disc as in claim 31 wherein said channels include a lip for retaining said optical fibers.

34. A flying disc as in claim 30 wherein said electronics housing includes 25 a base member, a battery, and a cap, wherein said battery is located between said base member and said cap.

35. A flying disc as in claim 34 wherein said base member includes a plurality of base elements and wherein said base elements substantially surround said battery.

30 36. A flying disc as in claim 35 wherein said cap snaps over said plurality of base elements, causing the base elements to grip said battery.

37. A flying disc as in claim 36 wherein said cap is rotatable relative to said base member.

38. A flying disc as in claim 34 wherein said cap includes a protrusion centrally located on said cap and extending toward said battery when said cap and
5 base member are engaged.

39. A method of making an illuminated flying disc, said method comprising:

providing a gliding body having a disc-shaped member and an annular rim integrally formed with said disc-shaped member, said annular rim extending in a
10 direction substantially away from the plane of said disc-shaped member; the inner surface of said rim and the lower surface of said disc-shaped member defining a semi-enclosed space; said gliding body including an aerodynamic surface including the upper surface of said disc-shaped member and the outer surface of said annular rim; and

15 integrating an electronic illumination system into said flying disc without altering the aerodynamic properties of said aerodynamic surface.

40. A method as in claim 39 and further including forming aerodynamic ridges in said aerodynamic surface.

41. A method of illuminating a flying disc, said method comprising:

20 providing a flying disc having an electronics chamber and a light emitting diode (LED) within said electronics chamber, said LED including a semiconductor chip embedded in a dielectric and a first electrical lead and a second electrical lead attached to said semiconductor chip;

25 placing a battery assembly in said electronics chamber so that a first conducting portion of said battery assembly directly contacts said first electrical lead; and

directly contacting a second portion of said battery assembly with said second electrical lead.

42. A method as in claim 41 wherein said battery assembly comprises a
30 single battery.

43. A method as in claim 41 wherein said battery assembly comprises a

dual battery assembly.

44. A switchable light source for a flying disc including a first surface and a second surface comprising:

a base member including a plurality of base elements;

5 a cap that covers said base elements;

a battery assembly having a first terminal and a second terminal located between said base elements and said cap; and

10 a light emitting diode (LED) having a first lead located to directly contact said first terminal and a second lead located substantially adjacent to one of said base elements,

wherein rotating said cap forces said one of said base elements towards said second terminal and causes said second lead to directly contact said second terminal.

45. A switchable light source for a flying disc as in claim 44 wherein said 15 cap is rotatable between a first position and a second position.

46. A switchable light source for a flying disc as in claim 45 wherein said cap includes a cam that does not engage said one of said base elements when said cap is in said first position and engages said one of said base elements when said cap is in said second position.

20 47. A switchable light source for a flying disc as in claim 46 wherein said one of said base elements is abbreviated to form an opening and wherein said cam is located substantially in said opening when said cap is in said first position.

48. A switchable light source for a flying disc as in claim 45 and further including a detent engageable by said cap to hold said cap in said second position.

25 49. A flying disc comprising:

a disc-shaped body member having a first surface and a second surface and terminating at its periphery in an annular rim; said first surface being essentially flat; said rim extending in a direction substantially away from the plane of said disc and together with said second surface defining a semi-enclosed space;

30 an electronics housing located on said second surface; said electronics housing comprising: a base member including a plurality of flexible base elements;

a cap that covers said base elements; a battery support creating an electronics recess between said battery and said second surface;

disc-illuminating electronics in said electronics recess; and

5 wherein said base members cap and battery support are located and adapted such that when said cap is placed on said base elements, said base elements and cap grip said battery forming a rigid electronic housing structure that protects said disc-illuminating electronics.

50. A flying disc as in claim 49 wherein said base elements extend substantially perpendicular from said second surface.

10 51. A flying disc as in claim 49 wherein said base elements further include an outwardly extending ridge substantially parallel to said second surface, and said cap further includes an inner perimeter groove for engaging said ridges.

52. A flying disc as in claim 49 wherein said battery support comprises a plurality of posts.

15 53. A flying disc as in claim 49 wherein said cap includes a beveled surface located to contact said battery.

54. A flying disc as in claim 49 wherein said electronics include a light emitting diode (LED).

55. A switchable light source for a flying disc comprising:

20 an electronics housing including a plurality of non-conductive flexible base elements and a cap covering said base elements; and

a switch mechanism comprising: a cam located on said cap; one of said base elements, and a conductive switch element in contact with said one base element; said cam, one base element, and conductive switch element located so that when said cap is rotated, said cam moves said base element to activate said switch.

25 56. A switchable light source for a flying disc as in claim 55 further including a battery located between said one of said base elements and said cap.

57. A switchable light source for a flying disc as in claim 56 wherein said 30 battery includes a pair of terminals, said flying disc further including a light emitting diode (LED) having a first lead located in contact with one of said terminals and a

second lead located substantially adjacent to one of said base elements.

58. A switchable light source for a flying disc as in claim 55 further including a detent located adjacent said cap to provide a stop mechanism for said rotation of said cap.

5 59. A method of illuminating a flying disc, said method comprising:
providing a flying disc having an electronics housing, an electronics housing cap, and a light source;
placing a battery in said electronics housing;
securing said battery in said electronics housing by placing said cap on said
10 electronics housing without turning on said light source; and
rotating said cap to turn on said light source.

60. A method as in claim 59 wherein said electronics housing includes a plurality of flexible base elements and wherein said securing comprises said cap bending said flexible base elements to grip said battery.

15 61. A method as in claim 59 wherein said placing comprises placing a dual battery assembly in said electronics housing.

62. A method for switching a light source for a flying disc including a base structure including a plurality of flexible non-conducting base elements, a cap that covers said base elements, a battery assembly having a first terminal and a
20 second terminal located between said base elements and said cap; and a light emitting diode (LED) having a first lead located in contact with said first terminal and a second lead located substantially adjacent to a one of said base elements, said method comprising:

rotating said cap and thereby pinching said one of said base elements
25 towards said second terminal; and contacting said second lead with said second terminal.

63. A flying disc comprising:
a disc-shaped body member having a first surface and a second surface and terminating at its periphery in an annular rim; said rim extending in a direction
30 substantially away from the plane of said first surface and together with said second surface defining a semi-enclosed space;

a light source for illuminating said flying disc;
a photovoltaic cell located on said first surface; and
a rechargeable battery connectable to said photovoltaic cell and said light source.

5 64. A dual battery adapter comprising:

a battery holding member having a first slot adapted to hold a first disc-shaped battery and a second slot for holding a second disc-shaped battery; and
said battery holding member sized and shaped to fit snugly into a battery chamber designed for a third disc-shaped battery that is larger than said first and
10 second battery.

65. A switchable light source comprising:

a base member including a plurality of base elements;
a cap that covers said base elements;
a battery assembly having a first terminal and a second terminal located
15 between said base elements and said cap; and _____
a light emitting diode (LED) having a first lead located in direct contact with
said first terminal and a second lead located substantially adjacent to one of said
base elements;
wherein rotating said cap forces said one of said base elements towards
20 said second terminal and said second lead into direct contact with said second
terminal.